

Applicant : Smedley et al.
Appl. No. : 10/595,451
Examiner : Emily P. Oham
Docket No. : 703538.4058

IN THE CLAIMS:

1 - 14. (Cancelled)

15. (Currently Amended) A method of modulating a three-phase three-level power converter comprising a first, a second and a third voltage source, each voltage source being configured to output a time-varying signal and being inductively coupled to a separate input node, each input node being connectable to a first output node, a second output node and a third output node, the converter further comprising a first capacitive element coupled between the first and the second output node and a second capacitive element coupled between the second output nodes and the third output node, wherein each time-varying voltage signal has substantially the same period and a different phase, the method comprising:

determining which voltage signal has the highest voltage, the lowest voltage and the intermediate voltage higher than one of the voltage signals and lower than the other voltage signal for each of a plurality of sub-periods;

determining which voltage signal is dominant for each of the plurality of sub-periods;

connecting the voltage signal having the lowest voltage to only the third output node when the dominant voltage signal is lower than the non-dominant voltage signals;

connecting the voltage signal having the highest voltage to one of the first output node and the second output node during each sub-period where the dominant voltage signal is lower than the non-dominant voltage signals;

connecting the voltage signal having the intermediate voltage to one of the second output node and the third output node during each sub-period where the dominant voltage signal is lower than the non-dominant voltage signals;

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connecting the voltage signal having the highest voltage to only the second output node when the dominant voltage signal is higher than the non-dominant voltage signals;

connecting the voltage signal having the lowest voltage to one of the first output node and the second output node during each sub-period where the dominant voltage signal is higher than the non-dominant voltage signals; and

connecting the voltage signal having the intermediate voltage to one of the second output node and the third output node during each sub-period where the dominant voltage signal is higher than the non-dominant voltage signals.

16. (Original) The method of claim 15, wherein the input nodes are connectable to the first and second output nodes with a plurality of switching elements.

17. (Currently Amended) The method of claim [17] 16, further comprising providing a universal controller configured to control the plurality of switching elements.

18. (Original) The method of claim 17, wherein the universal controller comprises a one-cycle control core.

19. (Original) The method of claim 15, wherein the universal controller comprises an average current mode control core.

20. (Original) The method of claim 15, wherein the universal controller comprises a current mode control core.

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21. (Original) The method of claim 15, wherein the universal controller comprises a sliding mode control core.

22. (Original) The method of claim 16, wherein the input node of the first voltage source is connectable to the first output node with a first switching element, to the second output node with a second switching element and to the third output node with a third switching element, the input node of the second voltage source is connectable to the first output node with a fourth switching element, to the second output node with a fifth switching element and to the third output node with a sixth switching element, and the input node of the third voltage source is connectable to the first output node with a seventh switching element, to the second output node with an eighth switching element and to the third output node with a ninth switching element.

23. (Original) The method of claim 22, wherein the period of the time-varying voltage signals is dividable into twelve substantially equal sub-periods.

24 – 48. (Cancelled)